

## Functional Description

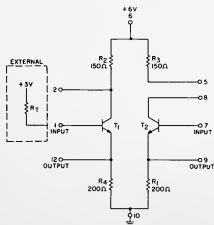
The Line Amplifier, LA-1A, is used to tap a transmission line at two or more locations, the tapped connections must present a high impedance to the transmission line to prevent loading.

The terminating resistor ( $R_T$ ) is external and connected only on the LA-1A at the receiving end of the transmission line. There can be only one  $R_T$  connection per transmission line. For a 93 $\Omega$  transmission line  $R_T$  should be a 100 $\Omega$  resistor.

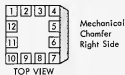
$T_1$  is an emitter follower. Resistor  $R_2$  is used to obtain emitter follower stability.

In normal operation the L.A. drives an AI or AOI module.

## Schematic

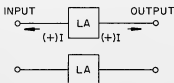


## Terminal Configuration



Pins 2, 3, 4 and 11 Leave Open

## Block Diagram



## Maximum Ratings

Input Voltage = 3.6V

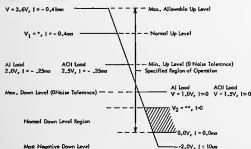
Output Voltage = 6.0V

$I_E = 23\text{mA}$

## LA-1A Module Functional Tests

TESTS	TERMINAL CONDITIONS												°C	ADDITIONAL LOAD REQUIREMENTS	VARIABLE	LIMITS		UNITS
	1	2	3	4	5	6	7	8	9	10	11	12				MIN	MAX	
DC ON	525Ω to +2.88V					+5.76V				GND		V <sub>O</sub>	25		V <sub>O</sub>	1.9		V
DC ON						+5.76V	525Ω to +2.88V		V <sub>O</sub>	GND			25		V <sub>O</sub>	1.9		V
DC OFF	+0.9V					+6.24V				GND		V <sub>O</sub>	75	CONSTANT CURRENT OF 1.8mA INTO TERM. 12	V <sub>O</sub>		0.45	V
DC OFF						+6.24V	+0.9V		V <sub>O</sub>	GND			75	CONSTANT CURRENT OF 1.8mA INTO TERM. 9	V <sub>O</sub>		0.45	V

## Input Requirements



\*This voltage is determined from the chosen value of  $R_T$  and its power supply return voltage, and is computed as follows,

$$V_1 = (\text{Min. value of power supply}) - (\text{Max. value of } R_T) (I_A \text{ mA})$$

where  $n$  = number of LA's connected to the line,

$R_T$  = resistance in KΩ; the equivalent resistance of  $R_T$  must equal 100Ω to properly terminate the communication line.

\*\*  $V_2$  is determined from the saturation level of the driver and the IR drop of the line,

$$V_2 = .3V + (I \text{ line Ray/ft.}) (\text{line length to LA in ft.}) (I)$$

where  $I$  = current flowing in communication line when the line driver is "ON".

## Output Specifications

Since the L.A. normally drives either an AI-2A or an AOL-2A and no other loads, the usable output is that of the driven AI-2A or AOI-2A. Refer to these circuits for output specifications.

### Maximum Power Supply Current Requirements (per module)

+6V	ON	OFF
	26ma	0

### Maximum Power Dissipation (per module)

ON	OFF
164.8mw	2.4mw

$$\text{Average Normal Power Dissipation} = \frac{\text{NOMINAL ON} + \text{NOMINAL OFF}}{2} = 74.1\text{mw}$$

### General Wiring Rules (For Printed Circuit Wire - 10 Mil Width Lines)

The input line length from the L.A. to the terminated line must not exceed 6 inches. This will insure the stability of the L.A. The maximum output length should not exceed 60 inches unless longer delays can be tolerated.